*Below average wheat harvest expected at the end of 2021-22 season*

KEY MESSAGES

- Hydrological and agricultural drought continues in Afghanistan, with historically low reservoir levels, delayed accumulation of snow water in the eastern, northeastern, central, and northern basins, and drier than average soil moisture conditions.

- The October-December winter wheat planting window is effectively over. Area under winter wheat is reported to be below average due to the low soil moisture and persistent below-average precipitation.

- Some northeastern and central parts of the country received only 45-60% of average precipitation while the rest of the country received 60-90% of average between October 1 and December 15, 2021 (**Figure 1**). Snow depth and snow water volume are also below average across the country (**Figures 2 and 3**).

- Based on ECMWF model and NOAA machine learning forecasts, above average precipitation is most likely from late December 2021 to mid-January 2021 related to the Madden Julian Oscillation (**Figure 4**). This period may offer the best chance this winter for improvements to the ongoing meteorological, agricultural, and hydrological drought in Afghanistan. Characteristically dry conditions related to La Niña are expected thereafter.

- As per the La Niña advisory, above average temperatures are expected until May 2022. Though La Niña is typically related to below average precipitation in Afghanistan, the latest NMME forecast indicates no tilt in the odds to below average precipitation in eastern and southern parts of the country for the period January-March 2022 (**Figure 5**).

Figure 1: October 1 – December 15, 2021, CHIRPS precipitation percent of average.

Data: *CHIRPS version 2.0 prelim.*, Source:*UCSB/CHC*
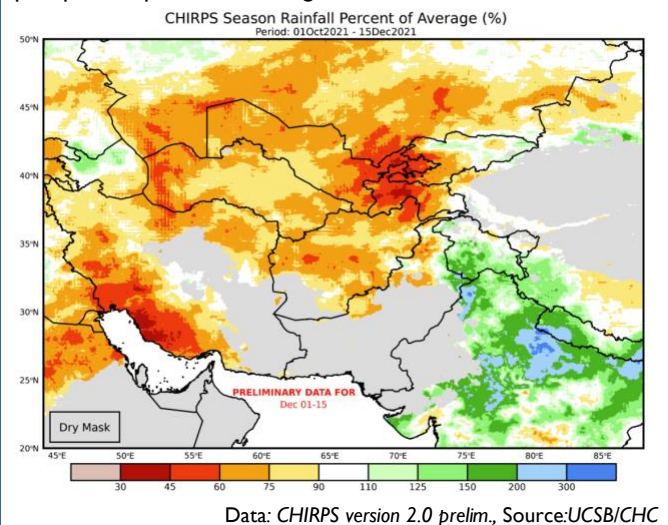
Figure 2: As of December 17, 2021, snow depth difference from the 2002-2017 average in mm.

Source: *USGS/NASA*
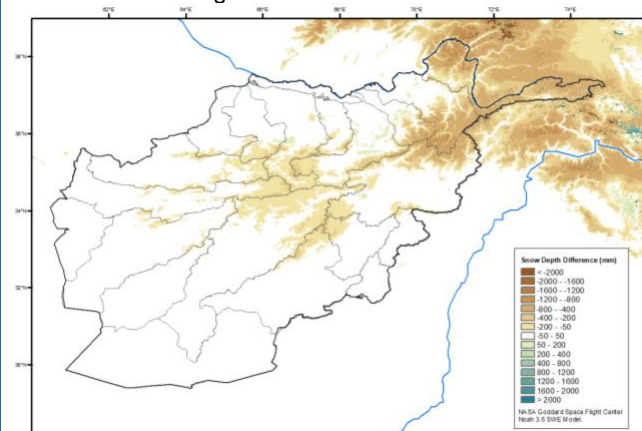
UPDATE ON SEASONAL PROGRESS

Current conditions:

Ongoing meteorological, agricultural, and hydrological drought, combined with the anticipated below-average snowpack development during the winter, are expected to lead to low streamflow and early depletion of snowpack during February-March 2022. These conditions reduce the prospects for normal wheat harvest and production in May-June 2022, and diminish the outlook for cultivation of second season crops in the country. Pastoral conditions are likewise anticipated to be negatively impacted.

Precipitation anomalies:

As of December 15, cumulative precipitation deficits (45-90% of average) prevailed across the country (**Figure 1**). Field reports indicate that only about half of normal winter wheat areas (national level average) are currently cultivated. The October-December window for planting of winter wheat is effectively closed; soils have begun freezing during the nights in many areas. Precipitation deficits have disrupted winter wheat planting more in the northern, central, and northwestern parts than in the eastern and southeastern parts of the country.

Snowpack and snow water volume:

Snow accumulation is below average in all basins (and well-below average in many basins) across the country (**Figure 2**). Snow water volumes are either close to or at historically lowest levels in the northeastern, eastern, central, and northern basins, while they have not yet begun accumulating in the rest of the country. Snow water volumes are at the historically lowest values in most basins in the country, including Kunduz and Kabul-Indus (**Figure 3**).
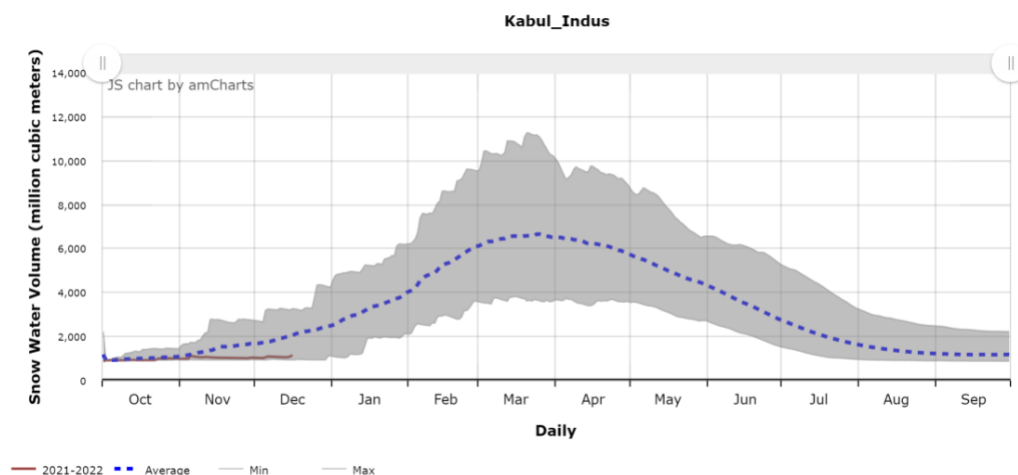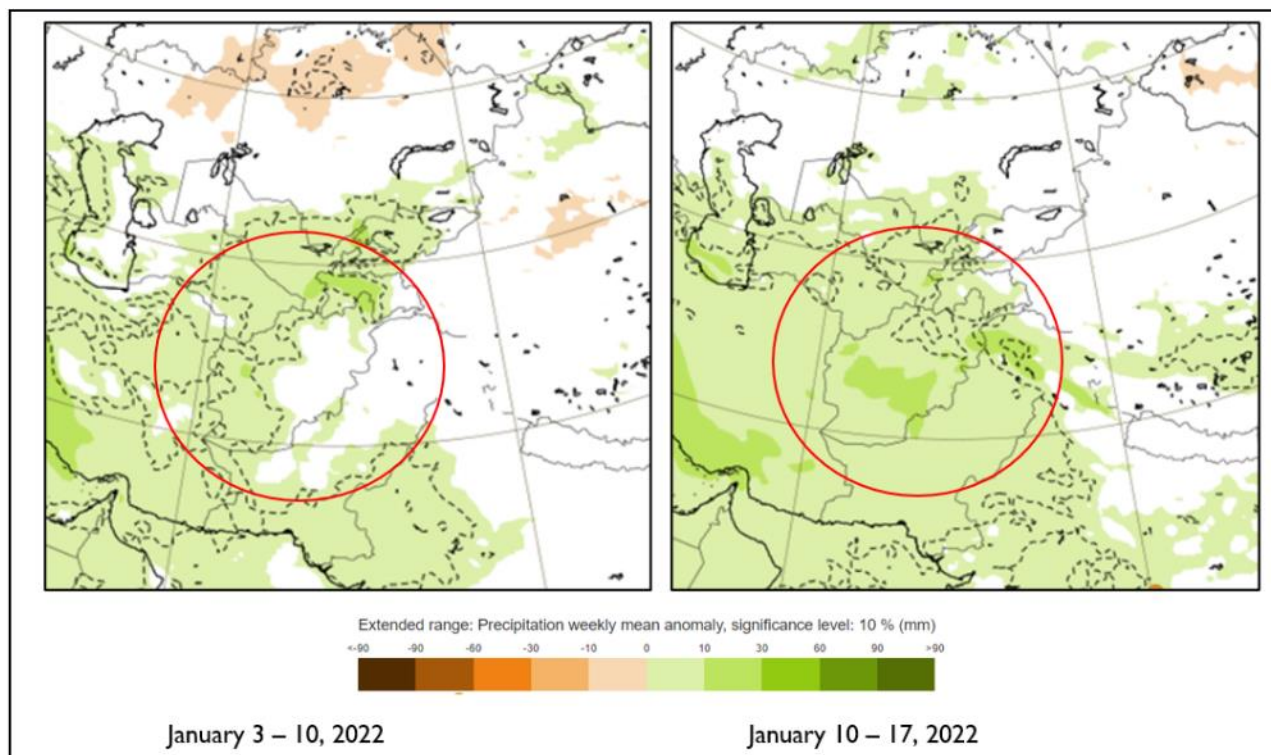

Figure 3. Very low seasonal snow water volume accumulation, compared to historical averages and minimum-maximum ranges, for the Kabul-Indus basin, as of December 17, 2021.

FORECAST

Precipitation:

According to ECMWF and NOAA machine learning forecasts, above average precipitation is most likely from late December 2021 to mid-January 2021 related to the forecast behavior of the Madden Julian Oscillation (**Figure 4**). Consistently, the latest NMME forecast indicates that there is no tilt in the odds to below average precipitation in eastern and southern parts of the country because of the above average precipitation forecast in January (**Figure 5**). This is despite the ongoing La Niña, which is generally associated with below average precipitation in Afghanistan.

Figure 4. Mean weekly precipitation from the ECMWF forecast system made on December 16, 2021 for (left) January 3 – January 10, 2022, and (right) January 10 – January 17, 2022.
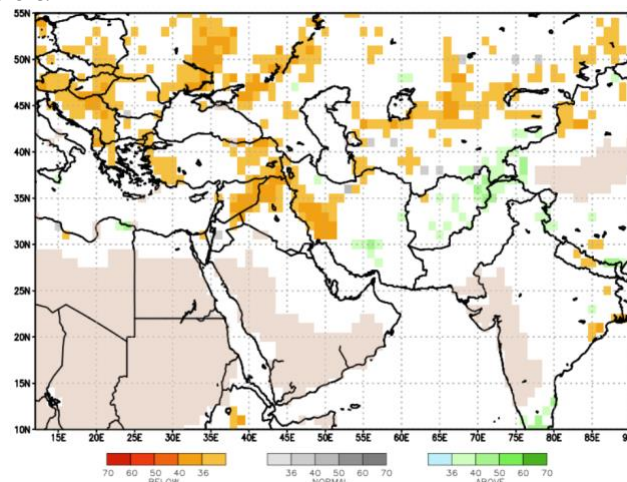

Extended range: Precipitation weekly mean anomaly, significance level: 10 % (mm)

January 3 – 10, 2022   January 10 – 17, 2022

Source: *ECMWF*

Temperatures:

The NMME forecast for January-March 2022 indicates a high probability of above-average temperatures across the country during this period. If higher temperatures result in early almond tree blossoming, then freezing temperatures may kill some blossoms, or lead to stunted fruit development later in the season, which would result in economic losses to the almond orchard growers.

It is expected that persistent above average temperatures may initiate earlier than normal snowmelt leading to reduced water availability for crop water use during spring and summer months. Above average temperatures may also result in moisture-stress in wheat cultivation during the growing season, especially in rainfed areas. The chances of widespread flooding in spring depend on the extent of snow accumulation during winter and above average temperatures during this period, but it is expected to be lower than average.

Figure 5. North American Multi-Model Ensemble precipitation forecast for January - March 2022 made in December 2021. Warm colors indicate the likelihood of precipitation in the lower tercile, and cool colors indicate the likelihood of precipitation in the upper tercile.

Source: *NOAA CPC*